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72) Inventors STEPHEN WESTABY
 WILLIAM GEORGE EVERETT



(54) A WOUND IRRIGATING DEVICE

(71) We, STEPHEN WESTABY and WILLIAM GEORGE EVERETT, both British Subjects, respectively of 14 Moss Drive, Cante-lupe Road, Haslingfield, Cambridgeshire and 17 Chaucer Road, Cambridge, Cambridge-shire, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a wound irrigating device.

There have been numerous prior proposals for wound irrigating or drainage devices. For example in British Patent Specification Number 641 061 there is disclosed a transparent convex shield which covers the wound and has inlet and discharge connections for a liquid used to wash or medicate the wound. A gasket of soft rubber is interposed between the skin and the shield. In British Patent Specification Number 1 150 294 there is disclosed a selectively permeable membrane which is laid over the wound and may have liquid inlet and outlet connections. British Patent Specification Number 1 210 746 discloses an appliance for treating sagging breasts. It has a cup of glass or plastic having a soft rubber marginal sleeve, and a tube for entry and exit of water. British Patent Specification Number 1 395 799 discloses a surgical evacuator having a rigid cup and a diaphragm therein for producing a suction. The cup has a marginal flange which engages the body of the patient. In United States Patent Specification Number 3 042 041 there is disclosed a cup which is placed over a wound, in combination with a drainage tube which in use extends into the wound. The interior of the cup is maintained under suction. A rim is provided to engage the skin of the user. United States Patent Specification Number 3 954 105 discloses a drainage system in which a thin pliable sheet of plastics mat-

erial is adhesively secured to the patient around the wound. A blanket of gelatinous material containing karaya gum is also provided. In United States Patent Specification Number 3 568 675 a surgical dressing is illustrated which has a moulded plastics cover dome. This is secured to the patient with collodion, or equivalent compounds. An exit tube for drainage is provided. United States Patent Specification Number 2 280 915 discloses a device for irrigating wounds having a special pad construction at its base, and entry and exit orifices for fluid. A suction may be applied to the interior and this enhances the security of attachment to the patient.

Other prior proposals have been made, *inter alia*, in British Patent Specification Numbers 992424, 1214707, 1384537 and 1457164, and in United States Patent Specification Numbers 2 025 492, 3 026 874, 3 823 720, 3 753 439, 3 908 664 and 3 367 332.

None of these prior proposals are totally satisfactory from the points of view of security of attachment of the device to the patient, and ease and comfort of the patient while the device is being worn. In addition, the use of many of them makes heavy demands on skilled nursing time.

According to the invention, a wound irrigating device includes a cover and a rim, the rim being of an adhesive which will adhere to moist body surfaces, the cover and the rim in use defining a closed chamber located over the wound and also defining an entry and an exit port for supply and removal of an irrigating fluid, in which the rim is or carries a plastics adhesive material comprising a blend of a water-soluble or water-swella- ble hydrocolloid and a water-insoluble, viscous, elastic binder.

The invention also provides a method of making a wound irrigating device which

involves bounding a cover to such a rim, and providing in the rim or in the cover an entry and an exit port for a fluid used as a wound irrigating fluid.

- 5 The cover may be of a synthetic plastics material. It may be transparent or it may have a transparent panel therein, so that the wound can be inspected without removing the device from the patient. The cover may be rigid but is preferably flexible. The adhesive material used may be as described in British Patent Specification Number 1 088 992. The adhesive may be secured directly to the cover rim or there may be a ring interposed therebetween for ease of manufacture. A drain bag may be secured to the outlet port, and one or more valves may be provided to allow control of the wound irrigating process.
- 20 In this Specification, the word "wound" is used to mean any break in the skin of a patient, and specifically includes both wounds caused by accidents or the like and wounds made in the course of surgery.
- 25 In a preferred form of the invention, the synthetic plastics cover is flexible. It may be of thin material which is ribbed, so that the whole device can be deformed to follow the curves of the body of the patient.
- 30 The invention will be better understood from the following particular and non-limiting description of an example thereof given with reference to the accompanying drawings in which:—
- 35 *Figure 1* is a plan view of one form of wound irrigating device; and
Figures 2 and 3 are cross-sections on the lines II-II and III-III respectively of *Figure 1*.
- 40 The device illustrated in *Figure 1* includes a flexible cover 10 which may be of a synthetic plastics material such as "PERSPEX" (Registered Trade Mark). The cover is slightly domed to enclose a space beneath it and above the wound 12. The cover has a rim 14 to which is attached a layer 16 of a plastics adhesive material comprising a blend of a water-soluble or water-swella-
50 binder. This is laid directly on the skin 18 of the patient. The adhesive rim material is more fully described in Patent Number 1 088 092. The cover and the rim define an entry port 20 and an exit port 22 for irrigating fluid. A conventional D.I. infusion set 24 is illustrated as connected to the entry port 20. It may include means such as a bung 26 whereby a gas such as hydrogen peroxide may be flushed through the device.
- 60 An outlet pipe 28 is connected to the exit port 22 and lends, in use, to a closed drainage system. It will be appreciated that a control valve, either manually or remotely operated, can be associated with either or
65 both of the entry or exit ports.

In a particular version of the invention, not illustrated, the cover is made of a thin flexible plastics material which is transversely ribbed so that its surface is undulating or wave-like. The distance between the peaks of adjacent waves may be from about 1/8 inch to about 1/4 inch, and the ribs preferably extend across the cover from one longitudinal edge to the other. The wave depth may be approximately 1/8 to 1/4 inch. This construction has been found to be particularly advantageous in allowing the device to follow the curve of a patient's body.

The adoption of the ribbed configuration allows a thinner plastics material to be used without the cover falling inwards to contact the wound, and as a consequence of the use of thinning material, the overall flexibility of the device is improved.

A wound irrigating device such as is particularly disclosed and illustrated herein has the following advantages:—

1. It provides a system for localised irrigation of infected wounds with antiseptics or hydrogen peroxide thus removing infected material and promoting the healing process.
2. It reduces the exposure of infected wounds to the atmosphere by eliminating the handling of soggy wet dressing. Thus it provides localised barrier nursing around the wound itself.
3. It prevents maceration of surrounding skin by wet dressings.
4. The transparent cover '10' allows rapid inspections of the wound without its exposure to the atmosphere and need for re-dressing.
5. It reduces 'nursing time' and will remain in place for a minimum of 48 hours.
6. It provides an environment enabling assessment of the role of topical antibiotics or antiseptics in the treatment of wound infection.

WHAT WE CLAIM IS:

1. A wound irrigating device including a cover and a rim, the rim being of an adhesive which will adhere to moist body surfaces, the cover and the rim in use defining a closed chamber located over the wound and also defining an entry and an exit port for supply and removal of an irrigating fluid, in which the rim is or carries a plastics adhesive material comprising a blend of water-soluble or water-swella-
115 hydrocolloid and a water-insoluble, viscous, elastic binder.
2. A device according to Claim 1 in which the cover is of a transparent plastics material.
3. A device according to Claim 1 in which the cover has a transparent panel
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therein.

4. A device according to Claim 1, 2 or 3 in which the plastics adhesive material is directly secured to the marginal portion of the cover.

5. A device according to Claim 1, 2 or 3 in which there is a ring interposed between the marginal portion of the cover and the plastics adhesive material.

10 6. A method of making a wound irrigating device which involves bonding a cover directly or indirectly to a rim of a plastics adhesive material comprising a blend of a water-soluble or water-swellable hydro-
15 colloid and a water-insoluble, viscous elastic

binder, and providing in the rim or the cover an entry and an exit port for a fluid.

7. A device according to any one of claims 1-5 in which the cover is of thin, ribbed, flexible synthetic plastics material. 20

8. A wound irrigating device substantially as herein particularly described with reference to and as illustrated in the accompanying drawings.

For the Applicants,
D. YOUNG & CO.
Chartered Patent Agents,
9 & 10, Staple Inn,
London, WC1V 7RD.

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